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Corporate Distress in East Asia

The effect of currency and interest rate shocks

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This Note reports the results of a study that quantified the effect of currency and interest rate shocks in East Asia on the liquidity and solvency of nonfinancial corporations in the region. In a survey of the five countries most affected by the East Asian financial crisis—Indonesia, the Republic of Korea, Malaysia, the Philippines, and Thailand—the study found that 63 percent of firms are illiquid (with earnings less than their debt service) and 31 percent technically insolvent (with financial obligations exceeding their equity).¹ Among solvent firms, about half are illiquid and at risk of insolvency unless their liquidity constraints are relieved. Worst affected is Indonesia, with 77 percent of firms illiquid (table 1). Malaysia has the fewest insolvent firms—5 percent—but even so, 63 percent of firms are illiquid. Nonperforming loans in the five countries could amount to 7 to 30 percent of GDP, and the share of nonperforming assets could be as high as 64 percent of GDP in Korea, and more than a third of the combined GDP in these countries. The study also sheds light on the high interest rate debate for each country. There is a clear tradeoff: higher interest rates will damage profits but could help to stabilize the currency, thus limiting the burden of external liabilities.

TABLE 1 CORPORATE AND ECONOMIC DISTRESS IN EAST ASIA, SEPTEMBER 1998

| Country | Illiquid firms (percent) | Insolvent firms (percent) | Nonperforming loans (percentage of GDP) | Nonperforming assets (percentage of GDP) |
|----------------|--------------------------|---------------------------|---|--|
| Indonesia | 77 | 65 | 29.9 | 39.4 |
| Korea, Rep. of | 50 | 41 | 24.8 | 64.2 |
| Malaysia | 63 | 5 | 14.4 | 25.1 |
| Philippines | 57 | 16 | 7.1 | 10.6 |
| Thailand | 65 | 23 | 27.9 | 41.2 |
| Average | 63 | 31 | 20.8 | 36.1 |

Source: World Bank staff estimates.



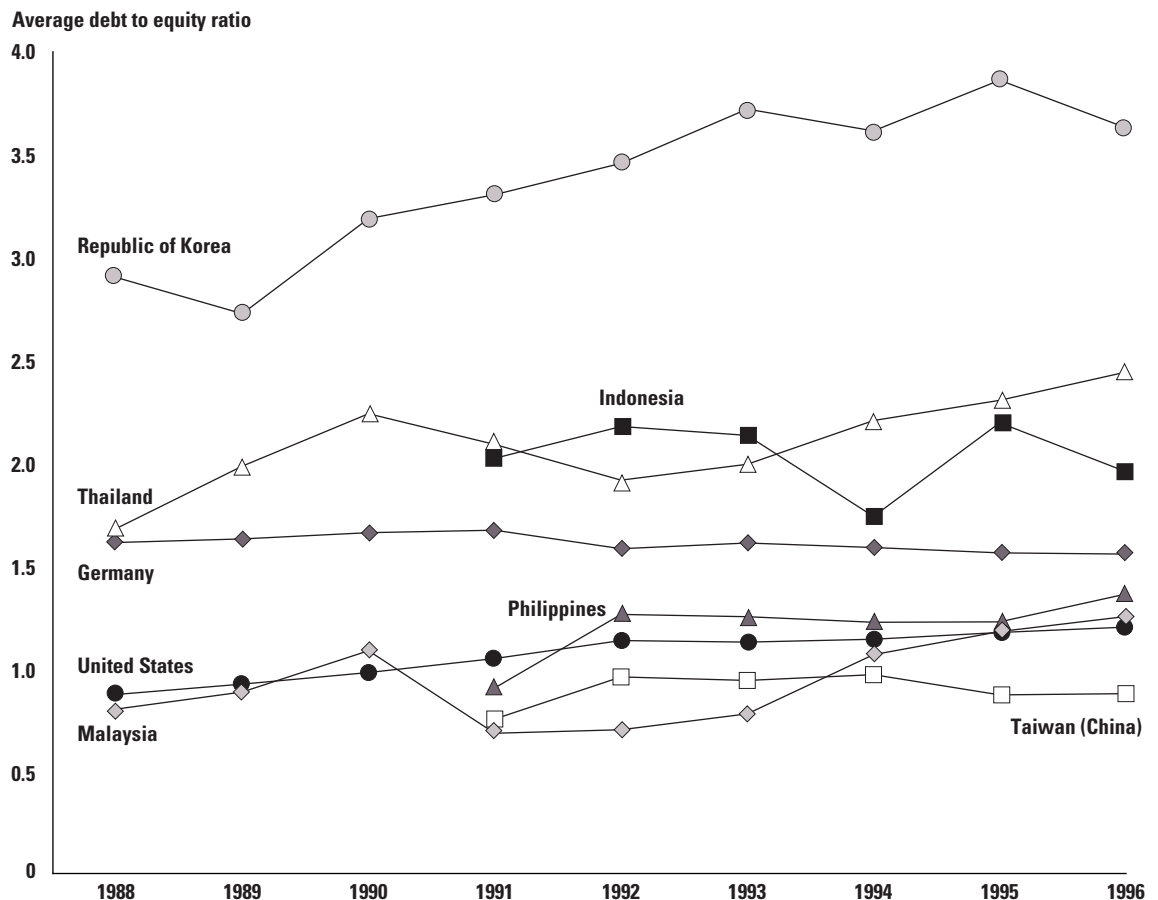
Pre-crisis conditions

The riskiness inherent in the liability structures of East Asian corporations is evident in the average debt to equity ratios in the period before the crisis, especially when compared with those in two industrial countries, Germany and the United States (figure 1).² Another comparator is Taiwan (China), included in the study as a benchmark because it has been less affected by the crisis. High external financing, mostly from bank lending, has been a characteristic of East Asian corporations. Korean firms had the highest debt to equity ratios in 1988–96, about five times as high as those of Taiwanese firms, which had the lowest. Leverage in Malaysia was also

relatively low, and while leverage in the Philippines was rising, it was still much lower than in Indonesia and Thailand. Most countries saw some increase in leverage in the past few years, most notably Korea, Malaysia, and Thailand. The rise in leverage in the Philippines is probably the result of its reforms in the mid-1980s, which revived the corporate sector and improved financing possibilities.

Short-term debt was high as a share of total debt during the entire period in all five East Asian countries (figure 2). Malaysia and Thailand stand out with shares of about 66 percent; the others have shares of about 58 percent. Despite all the attention to the role of short-term debt in the

FIGURE 1 CORPORATE LEVERAGE, 1988–96



Source: World Bank staff estimates.

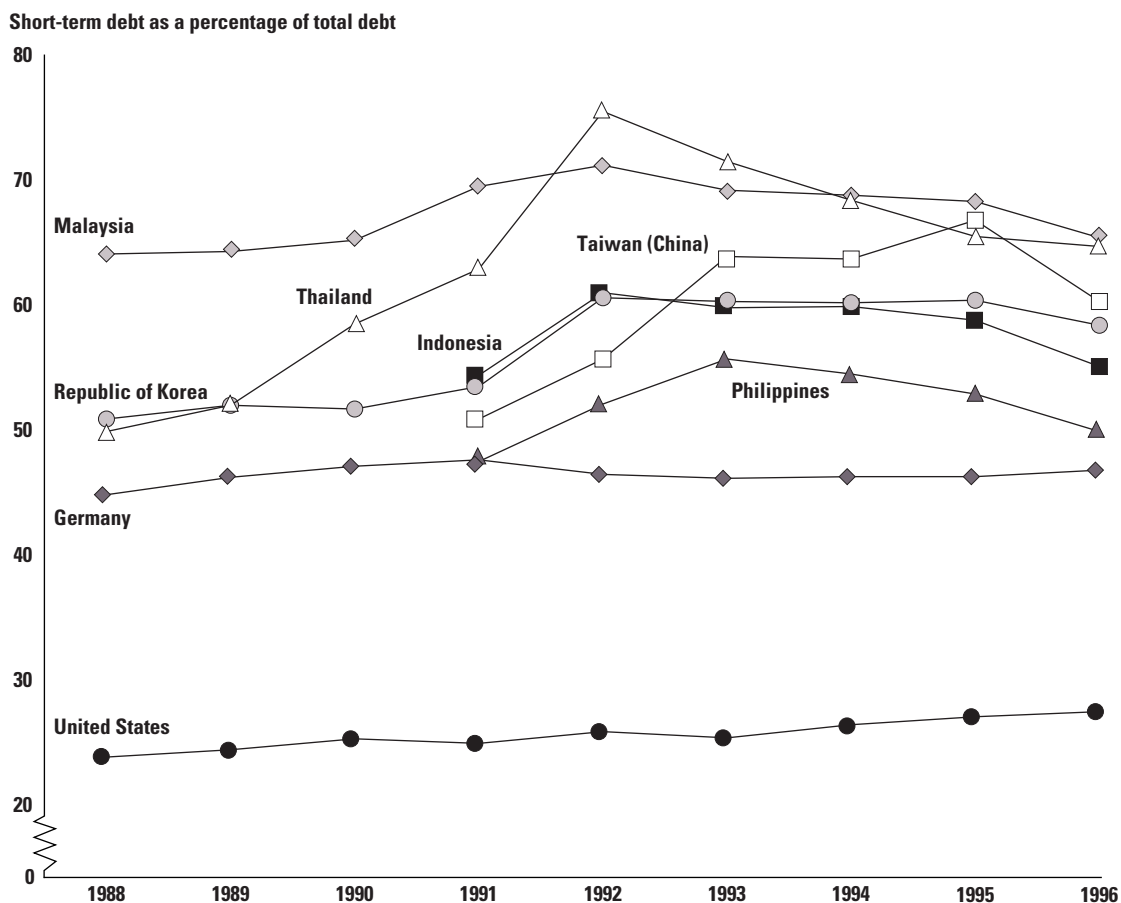
East Asian financial crisis, the data do not suggest a massive buildup in short-term debt in the region in the past few years. Instead, they indicate a gradual increase over a longer period, with even some decline in the past several years. Nevertheless, these ratios are much higher than those in many industrial countries. In the United States, for example, the share of short-term debt is about 25 percent, and in Germany it is about 45 percent.

These short-term debt shares do not distinguish foreign exchange liabilities from domestic debt, and in some countries and times the debt composition may have included more short-term foreign exchange debt than in others. Data on debt composition shows that the structure of

debt varied greatly across East Asian economies in 1996 (figure 3). Korean firms had the largest share of total foreign exchange debt, followed by Malaysian firms. Malaysian firms had the largest share of foreign short-term debt, followed by Korean and Thai firms. And firms in Taiwan (China) and the Philippines had the largest share of domestic long-term debt.

Data also suggest large differences across countries before the crisis in the share of earnings absorbed by interest payments. Taiwanese corporations needed to devote only a small share of earnings (before interest and taxes) to interest payments, about 14 percent (figure 4). Thai and Korean corporations had the highest share

FIGURE 2 CORPORATE SHORT-TERM DEBT, 1988–96



Source: World Bank staff estimates.

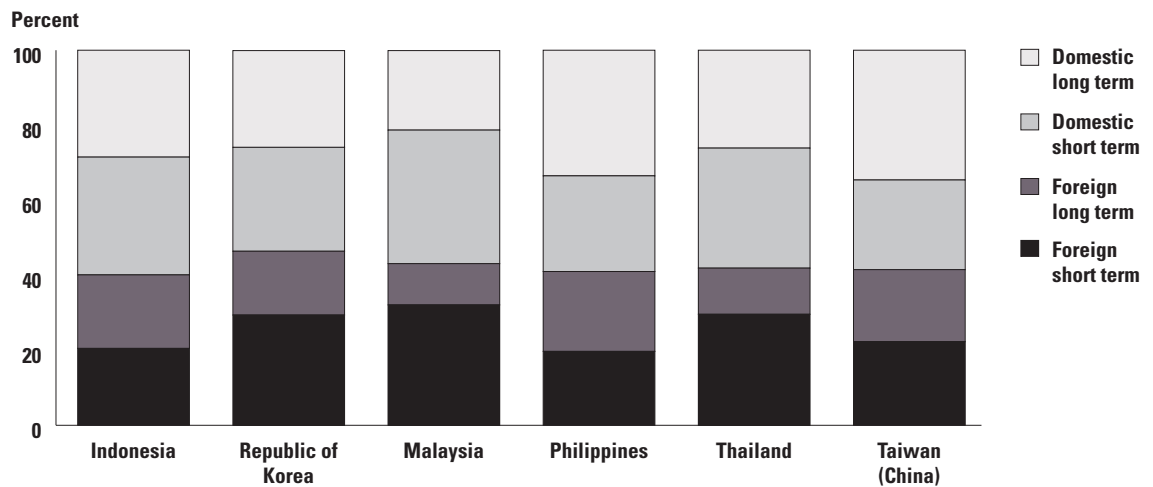
of interest expenses, about 37 percent and 39 percent. (Indonesian, Malaysian, and Philippine corporations averaged about 25 percent.) These ratios are much higher than those typical in industrial countries. In Germany, for example, interest payments in 1996 represented only 26 percent of earnings (before interest and taxes); for Japanese firms interest payments averaged only 10 percent. The high share for interest payments in the five East Asian countries meant

that firms were very vulnerable to a rise in interest rates (or a drop in earnings).

Currency and interest rate effects

The study assessed both the combined and separate effects of the currency and interest rate shocks in the second half of 1997 and in 1998 on East Asian firms' liquidity and solvency. The pros and cons of a high interest rate policy have

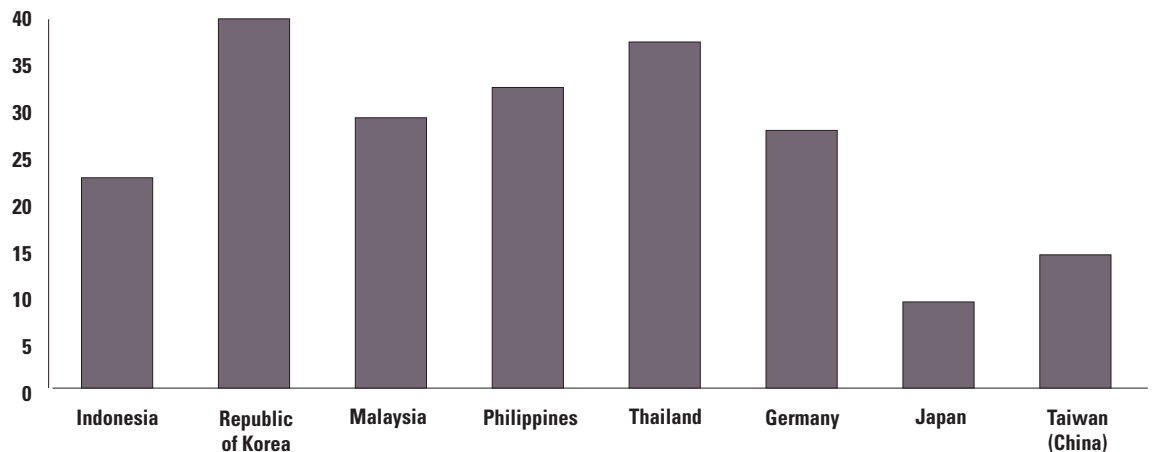
FIGURE 3 CORPORATE DEBT COMPOSITION, 1996



Source: World Bank staff estimates.

FIGURE 4 INTEREST COVERAGE, 1996

Interest payments as a percentage of earnings before interest and taxes



Source: World Bank staff estimates.

been much debated in the analysis of the East Asian financial crisis. One aspect of that debate is the effect on corporate balance sheets. Here a clear tradeoff exists: higher domestic interest rates will damage corporations' profitability, but could help in stabilizing the country's currency, thus helping corporations by limiting the burden of high debt service on their external liabilities. The analysis shows the degree of tradeoff between these two effects for each country.

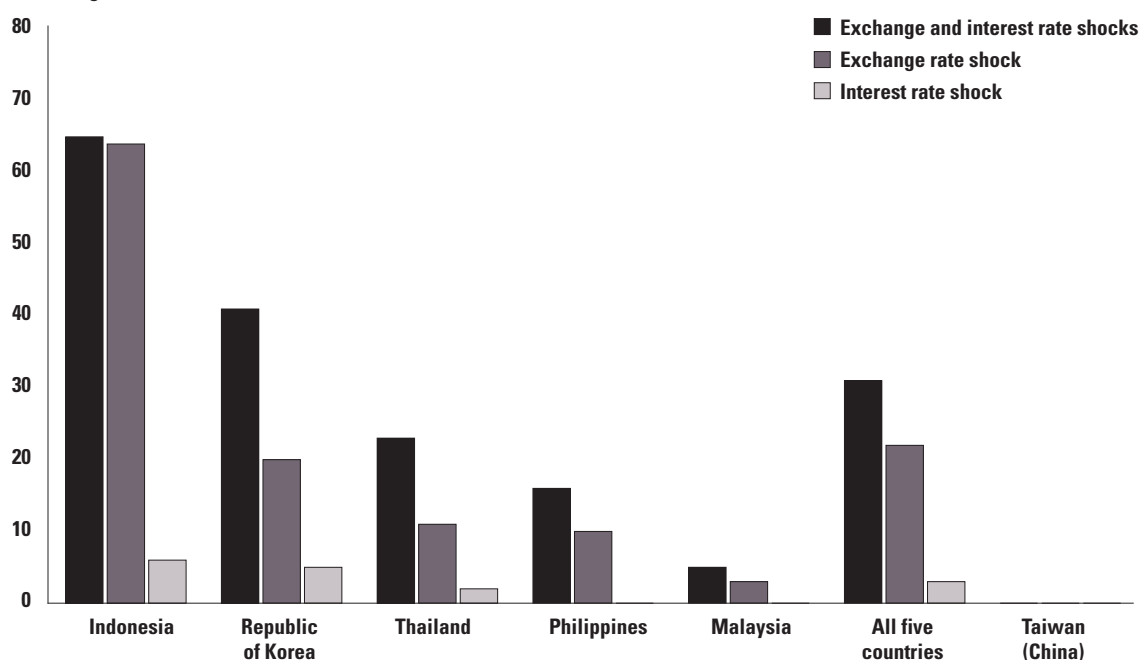
For each country it calculated the average exchange rate for September 1–13, 1998, and compared that with the average exchange rate in March 1997, taken as the precrisis value. For the interest rate shock, the study compared the average domestic currency bank lending rate over the first half of 1998 with the average lending rate in the first half of 1997. To adjust for the fact that the bank lending rates used are average rates, not marginal rates on new loans, it added to the postcrisis lending rate the change in the spread between the offshore (quoted in

Singapore) and the onshore three-month inter-bank rates for the currency. The change in this spread indicates how marginal lending rates have changed (as a result of changes in the opportunity costs of funds for banks). The study also revised upward the interest rate paid on foreign currency debt by a factor proportional to the increase in the spread between the rate on U.S. dollar-denominated sovereign bonds issued by the country and the rate on U.S. Treasury bonds of similar maturity.

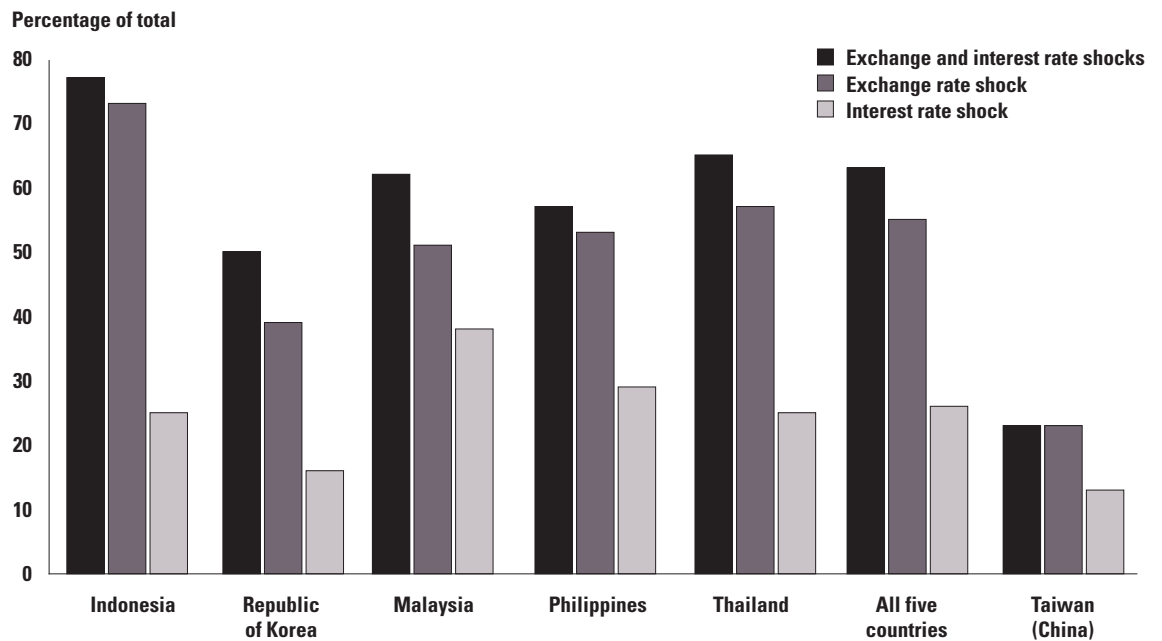
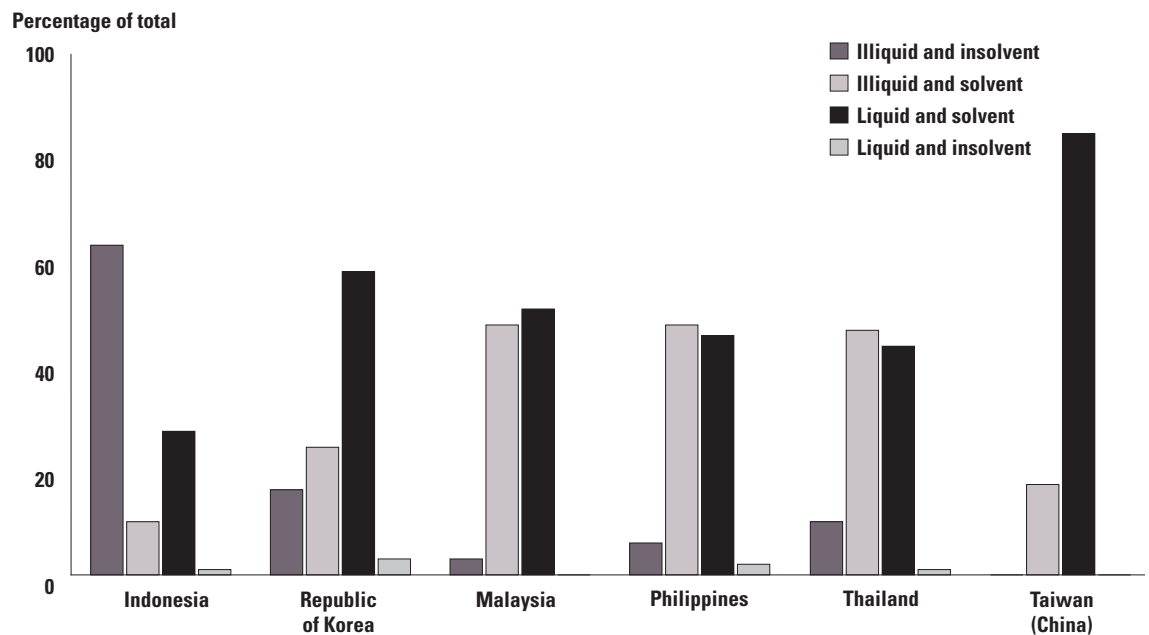
The study computed the effect of the shocks in terms of corporate financial obligations at the end of 1996 using 1996 balance sheet figures and profit and loss statements. It defined firms as technically insolvent when the increase in financial obligations calculated at new exchange and interest rates exceeded equity at the end of 1996. And it defined firms as illiquid when 1996 earnings (before interest and taxes) fell short of debt service obligations projected at new exchange and interest rates. It used three scenarios:

FIGURE 5 INSOLVENT FIRMS AFTER THE CURRENCY AND INTEREST RATE SHOCKS

Percentage of total



Source: World Bank staff estimates.

FIGURE 6 ILLIQUID FIRMS AFTER THE CURRENCY AND INTEREST RATE SHOCKS**FIGURE 7** ILLIQUID AND INSOLVENT FIRMS AFTER THE CURRENCY AND INTEREST RATE SHOCKS

both exchange rate and interest rate shocks, interest rate shock only, and currency shock only.

The study calculated the effect of the exchange rate shock as the increase in the value of foreign currency debt—assumed to be denominated entirely in U.S. dollars—due to the domestic currency devaluation.³ It estimated the effect of the interest rate shock by applying the estimated increase in domestic corporate borrowing rates to debt denominated in domestic currency,⁴ and applying the estimated increase in corporate foreign currency borrowing rates to debt denominated in foreign currency.

The results show that after the two shocks the share of insolvent firms is 31 percent on average for the five most affected East Asian countries (figure 5). For all five countries the currency shock is more important than the interest rate shock. If only the currency shock had happened, 22 percent of East Asian firms would be technically insolvent. Indonesia is by far the hardest

hit, with 65 percent of firms estimated to be insolvent. Here, as expected, the damage to the corporate sector stems mainly from the large depreciation of the currency, much less so from the increase in interest rates. In Korea 41 percent of corporations are technically insolvent. Here the effect of the currency depreciation still dominates, but the interest rate shock is also important, and half the firms that are insolvent are so because of the combination of the interest rate and currency shocks. In Thailand about a quarter of firms are insolvent, most because of the exchange rate shock. No Taiwanese firm in the sample is technically insolvent.

There can, of course, be both overlap and interaction between the two shocks. In Indonesia the share of insolvent firms in the scenario with both shocks is smaller than the sum of the shares in the scenarios with single shocks because the same firms are insolvent under both shocks. In Korea the two shocks interact, and the share of insolvent firms in the scenario with both shocks

TABLE 2 ESTIMATED NONPERFORMING LOANS AND NONPERFORMING ASSETS AS A SHARE OF GDP, SEPTEMBER 1998

| Country | Sample firms with debt servicing difficulties (percent) | Sample firms' nonperforming loans (percentage of total loans) | Bank credit to the private sector (percentage of GDP) | Total nonperforming loans (percentage of GDP) ^a | Domestic credit (percentage of GDP) ^b | Total nonperforming assets (percentage of GDP) ^c |
|----------------|---|---|---|--|--|---|
| Indonesia | 64.8 | 52.6 | 57.0 | 29.9 | 75.0 | 39.4 |
| Korea, Rep. of | 40.8 | 38.9 | 64.0 | 24.8 | 165.0 | 64.2 |
| Malaysia | 4.6 | 15.2 | 95.0 | 14.4 | 165.0 | 25.1 |
| Philippines | 16.3 | 13.6 | 52.0 | 7.1 | 78.0 | 10.6 |
| Thailand | 22.9 | 26.6 | 105.0 | 27.9 | 155.0 | 41.2 |
| Simple average | 30.2 | 29.4 | 74.6 | 20.8 | 127.0 | 36.1 |

a. Calculated by multiplying sample firms' nonperforming loans as a percentage of total loans by total bank credit to the private sector as a percentage of GDP.

b. Domestic credit includes credit from nonbank financial institutions (such as insurance companies) and capital market instruments.

c. Calculated by multiplying sample firms' nonperforming loans as a percentage of total loans by domestic credit as a percentage of GDP.

Source: World Bank staff estimates except for bank credit to the private sector (Bank for International Settlements 1998) and domestic credit as a share of GDP (J.P. Morgan).

exceeds the sum of the shares in the scenarios with single shocks.

Illiquidity is much more pervasive than insolvency. Even before the crisis 11 percent of Thai firms, 15 percent of Malaysian firms, and 27 percent of Philippine firms were illiquid (that is, their earnings did not cover interest payments). After the crisis 77 percent of Indonesian firms, 65 percent of Thai firms, 63 percent of Malaysian firms, 57 percent of Philippine firms, and 50 percent of Korean firms were illiquid (figure 6). Even in Taiwan (China) about 20 percent of firms face liquidity problems. Interestingly, in most countries the interest shock becomes more important when illiquidity is considered.

The differences between liquidity and solvency problems reveal important insights. The share of firms that are illiquid but technically solvent is large, averaging 35 percent for the five East Asian countries (figure 7). Thus many solvent firms, unable to cover current debt service payments from earnings, are at risk of insolvency. These firms may have difficulty obtaining outside financing for working capital to maintain ongoing operations, and may be operating at too low a level. Restoring credit flows to these solvent firms is important to restart growth in these countries.

Finally, the study estimated nonperforming loans and nonperforming assets as a share of GDP for the five most affected countries, extrapolating from data for the firms in the sample that cannot meet their debt service requirements under the current interest and exchange rates (table 2). Because the estimates are based on large firms, which typically have higher debt to equity ratios, they may overstate the actual share of nonperforming loans.

The results show that nonperforming loans as a share of GDP are largest in Indonesia (29.9 percent), Korea (24.8 percent), and Thailand (27.9 percent), and smallest in the Philippines (7.1 percent). The average for the five countries is 20.8 percent. The ratio of nonperforming assets to GDP is largest in Korea (64.2 per-

cent), followed by Thailand (41.2 percent) and Indonesia (39.4 percent). The Philippines has the smallest amount of nonperforming loans relative to GDP (10.6 percent).

A related paper (Claessens, Djankov, and Lang 1998) documents the performance and financing structures of East Asian corporations over the past decade. Using a database of 5,550 East Asian firms in nine countries over the period 1988–96, it identifies some important patterns across countries. Leverage was high and increasing in Indonesia, Japan, Korea, and Thailand. Foreign exchange short-term borrowing became important in the past few years, especially in Korea, Malaysia, and Thailand. These vulnerabilities in corporate financial structures have played an important part in triggering and aggravating East Asia's financial crisis, and in leading many corporations into bankruptcy (Ferri, Hahm, and Bongini 1998).

¹ The data come from Worldscope and Extel databases and are compiled from annual reports of the nonfinancial companies listed on the major stock exchanges in the region. The sample consists of 463 firms: 82 for Indonesia, 79 for Korea, 79 for Malaysia, 62 for the Philippines, 99 for Thailand, and 62 for Taiwan (China). The exchange rates used are from the International Monetary Fund's International Financial Statistics and Bloomberg. The lending rates are from national sources, mostly the central bank, and the offshore interest rates from J.P. Morgan, Singapore.

² As used in this Note, the debt to equity ratio is total debt (long term, short term, trade credits) over the nominal value of common equity.

³ Data availability problems prevented the study from computing the positive effect of the devaluation in terms of the increased value of assets denominated in foreign currency. Neglecting this effect could lead to overestimates of insolvency. But the analysis also neglects the negative demand shock triggered by the crisis, a shock that likely outweighs any positive effect stemming from revaluation of foreign currency assets.

⁴ To account for the repricing of loans, the study applied the entire increase to short-term domestic currency debt but only a third of the increase to long-term domestic currency debt. This amounts to assuming that long-term domestic currency debt pays fixed rates and has a three-year maturity. This process was repeated for foreign currency debt.

References

- Bank for International Settlements. 1998. *68th Annual Report*. Basle, Switzerland.
- Claessens, Stijn, Simeon Djankov, and Larry Lang. 1998. "East Asian Corporations: Growth, Financing, and Risks over the Last Decade." Policy Research Working Paper 2021. World Bank, Washington, D.C.
- Ferri, Giovanni, Hongjoo Hahm, and Paola Bongini. 1998. "Corporate Bankruptcy in Korea: Only the Strong Survive." World Bank, Washington, D.C.
- World Bank. 1998. *East Asia: The Road to Recovery*. Washington, D.C.

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